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10/825,587	04/14/2004	Steven J. Visco	PLUSP038	8178
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BEYER WEAVER LLP			CANTELMO, GREGG	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/825,587

Applicant(s)

VISCO ET AL.

Examiner

Gregg Cantelmo

Art Unit

1795

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 September 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13, 21 and 24-26 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-13, 21 and 24-26 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/S508)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Response to Amendment

1. In response to the amendment received September 5, 2008:
 - a. Claims 1-13, 21 and 24-26 are pending;
 - b. The specification objection has been overcome in light of the amendment;
 - c. The double patenting rejection stands;
 - d. The prior art rejections of record stand.

Double Patenting

2. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

3. Claims 1-3, 5, 7-13 and 21 are provisionally rejected on the ground of

nonstatutory obviousness-type double patenting as being unpatentable over claims of copending Application No. 10/772,157 in view of U.S. Patent No. 6,413,285 (Chu) or JP

62-243247 (JP '247). Although the conflicting claims are not identical, they are not patentably distinct from each other.

Copending Application No. 10/772157 claims an electrochemical cell comprising: an active metal anode having a first surface and a second surface; a cathode structure comprising an electronically conductive component, an ionically conductive component, and an electrochemically active component, wherein at least one cathode structure component comprises an aqueous constituent; an ionically conductive protective membrane on the first surface of the anode, the membrane comprising, one or more materials configured to provide a first surface chemically compatible with the active metal of the anode in contact with the anode, and a second surface substantially impervious to and chemically compatible with the cathode structure and in contact with the cathode structure (Claim 1 as applied to instant claim 1). The cathode structure employs water which is the active component (claim 3 as applied to claims 1 and 5). The anode material is lithium (claim 44 as applied to claims 1 and 9).

The protective membrane is a composite comprising first and second materials having identical compositions (claim 50 as applied to claim 2) and the membrane has the same requisite ionic conductivity (claim 49 as applied to claim 3).

The membrane is a laminate (claim 51 as applied to claim 7) and has a graded composition (claim 52 as applied to claim 8).

The first component is a composite reaction product of active metal with Cu_3N , active metal halides, active metal phosphides and active metal halides and active metal phosphorous oxynitrides (claim 53 as applied to claim 10) or a composite reaction

product of active material with Cu_3N , Li_3N , Li_3P , and LiI , LiBr , LiCl , LiF and LiPON claim 55 as applied to claim 11).

The second composite comprises a material selected the group consisting of glassy or amorphous metal ion conductors, ceramic active metal ion conductors, and glass-ceramic active metal ion conductors (claim 56 as applied to claim 12) and has the same composition as that of claim 13 (see claim 57).

The differences between claims 1 and 21 and copending Application No. 10/772157 are that copending Application No. 10/772157 does not teach of the anode comprising a first Li metal layer, a second Li metal layer and a thin Li-alloying metal layer between the two Li layers (claim 1) wherein the middle layer is silver (claim 21).

Chu teaches of lithium anode configuration wherein the anode includes two lithium active layers disposed about a metal bonding layer such as aluminum or silver (col. 3, ll. 30-36). (see Figs. 2C-2F and col. 11, line 58 through col. 12, line 54). JP '247 discloses of a lithium battery wherein the anode is configured as a 3 layer structure with two outer lithium layers 2 disposed about an aluminum inner layer 1 (abstract and Fig. 1).

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the claimed invention of copending Application No. 10/772157 by configuring the anode as taught by either Chu or JP '247 since it would have provided an anode having improved bonding between the multilayer electrochemical cell structure.

With respect to the use of silver (claim 21), any material which is capable of alloying with lithium would have been an art-recognized equivalent material disposed between the two lithium layers. The selection of a known material based on its suitability for its intended use supported a prima facie obviousness determination in *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945) See also *In re Leshin*, 227 F.2d 197, 125 USPQ 416 (CCPA 1960). MPEP § 2144.07.

While the exact scope of the claims in each application are not verbatim, the invention claimed in both the instant application and in copending Application No. 10/772,157 are reasonably obvious over one another and thus not held to be patentably distinct.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

4. Claims 24-26 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over copending Application No. 10/772,157 in view of either Chu or JP '247 as applied to claims 1 and 2 above and further in view of U.S. patent No. 7,282,296 (Visco '296), U.S. Patent No. 7,282,302 (Visco '302).

Copending Application No. 10/772,157 does not claim the materials of claims 24-26 however the reference does disclose such (see para. 82).

Visco '296 claims the layer as a reaction product of Li with Cu₃N (claim 1 applied to claim 24). Visco '302 claims the layer as a reaction product of Li with Cu₃N with red phosphorous (claim 1 applied to claim 25). Visco '296 further discloses the

layer as a reaction product of Li with PbI₂ (col. 13, ll. 40-50 applied to claim 26). The selection of a known material based on its suitability for its intended use supported a prima facie obviousness determination in *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945) See also *In re Leshin*, 227 F.2d 197, 125 USPQ 416 (CCPA 1960). MPEP § 2144.07. In the case of the instant application, selection of these materials would have been obvious to provide materials having desired levels of ionic conductivity, chemical compatibility with the lithium anode and protection of the reactive lithium active material.

This is a provisional obviousness-type double patenting rejection.

Response to Arguments

5. Applicant's arguments filed September 5, 2008 have been fully considered but they are not persuasive.

Applicant argues that the Visco application, including its claims, lacks any teaching or suggestion of the renewable active metal anode as recited in the claims.

This argument is not persuasive.

The claim limitation recites "a renewable active metal anode, configured for supplementation of the active metal".

Chu teaches of lithium anode configuration wherein the anode includes two lithium active layers disposed about a metal bonding layer such as aluminum or silver (col. 3, ll. 30-36). (see Figs. 2C-2F and col. 11, line 58 through col. 12, line 54). JP '247 discloses of a lithium battery wherein the anode is configured as a 3 layer structure

with two outer lithium layers 2 disposed about an aluminum inner layer 1 (abstract and Fig. 1).

These configurations are identical to the claimed anode structure and thus are held to be renewable active metal anodes, configured for supplementation of the active metal.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

6. Claims 1, 3, 9 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP '471 in view of either Chu or JP 62-243247 (JP '247).

Note regarding Chu: The applied reference has a common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art only under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not an invention "by another"; (2) a showing of a date of invention for the claimed subject matter of the application which corresponds to subject matter disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference under 37 CFR 1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). This rejection might also be overcome by showing

that the reference is disqualified under 35 U.S.C. 103(c) as prior art in a rejection under 35 U.S.C. 103(a). See MPEP § 706.02(l)(1) and § 706.02(l)(2).

JP '471 discloses a lithium/air cell comprising a lithium anode 4, a porous cathode 2 and a solid electrolyte 5 disposed between the cathode and anode (abstract and Fig. 1 as applied to generic claim 1).

Li3N is the same type of material disclosed in the instant application for one of the layers and thus is held to exhibit the same requisite properties of claim 1 and ionic conductivity required in claim 3.

The cathode oxidant comprises air (abstract).

The anode is solid-state lithium (as applied to claim 9).

The differences between claims 1 and 21 and JP '471 are that JP '471 does not teach of the anode comprising a first Li metal layer, a second Li metal layer and a thin Li-alloying metal layer between the two Li layers (claim 1) wherein the intermediate layer is silver (claim 21).

Chu teaches of lithium anode configuration wherein the anode includes two lithium active layers disposed about a metal bonding layer such as aluminum or silver (col. 3, ll. 30-36). (see Figs. 2C-2F and col. 11, line 58 through col. 12, line 54). JP '247 discloses of a lithium battery wherein the anode is configured as a 3 layer structure with two outer lithium layers 2 disposed about an aluminum inner layer 1 (abstract and Fig. 1). This structure, equivalent to the claimed structure is held to be a renewable anode, configured for supplementation of the active metal.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of JP '471 to have the 3 layer anode structure as taught by either Chu or JP '247 since it would have provided an anode having improved bonding between the multilayer electrochemical cell structures. Furthermore, the selection of a known material based on its suitability for its intended use supported a prima facie obviousness determination in *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945) See also *In re Leshin*, 227 F.2d 197, 125 USPQ 416 (CCPA 1960). MPEP § 2144.07.

With respect to the use of silver (claim 21), any material which is capable of alloying with lithium would have been an art-recognized equivalent material disposed between the two lithium layers. The selection of a known material based on its suitability for its intended use supported a prima facie obviousness determination in *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945) See also *In re Leshin*, 227 F.2d 197, 125 USPQ 416 (CCPA 1960). MPEP § 2144.07.

7. Claims 2, 7 and 10-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP '471 in view of Chu or JP '247 as applied to claim 1 above, and further in view of U.S. Patent No. 5,314,765 (Bates).

The first material is Li_3N which is an identical material to those claimed active metal nitrides and thus broadly reads on the Markush groups of claims 10 and 11).

The teachings of claim 1 have been discussed above and are incorporated herein.

JP '471 does not appear to expressly disclose of the conductive protective membrane being a multilayer structure (claim 2); that the membrane is a laminate (claim 7) or that the second material is a group of materials recited in claim 12.

Bates teaches of providing a multilaminate composition comprising a first layer of Li_3N and a top layer of LiPON thereon (Fig. and col. 2, ll. 50-65).

The addition of a top layer of LiPON to the system of JP '471 would have improved the life of operation of the cell of JP '471 by protecting the reactive anode from other components in the system.

8. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over JP '471 in view of Chu or JP '247 as applied to claim 1 above, and further in view of U.S. Patent No. 3976509 (Tsai).

The teachings of claim 1 have been discussed above and are incorporated herein.

JP '471 does not appear to expressly disclose water as the cathode fluid oxidant.

While JP '471 discloses using air for the cathode fluid oxidant, use of other oxidant sources such as water in lithium electrochemical cells has been well established in the art as taught by Tsai (abstract).

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of JP '471 by using any number of cathode fluid oxidants including water since such materials have been established cathode fluids in the art as taught by Tsai and since it has been established that the selection of a known material based on its suitability for its intended use

supported a prima facie obviousness determination in *Sinclair & Carroll Co. v.*

Interchemical Corp., 325 U.S. 327, 65 USPQ 297 (1945) See also *In re Leshin*, 227 F.2d 197, 125 USPQ 416 (CCPA 1960). MPEP § 2144.07.

9. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over JP '471 in view of Chu or JP '247 as applied to claim 1 above, and further in view of U.S. Patent No. 6,025,094 (Visco '094).

The teachings of claim 1 have been discussed above and are incorporated herein.

JP '471 does not appear to expressly disclose of the protective membrane being a graded composite.

Visco '094 teaches of using graded protective composite layers in a lithium battery (col. 8, ll. 35-52).

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of JP '471 by selecting the protective layer to be a graded composite membrane as taught by Visco '094 since it would have provided a more homogeneous layer having reduced internal stress (Visco '095 col. 9, ll. 33-40).

10. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over JP '471 in view of either Chu or JP '247 and Bates as applied to claim 12 above, and further in view of U.S. Patent No. 6,485,622 (Fu).

The difference not yet discussed is of the particular material of claim 13 for the second component.

Fu teaches that the same lithium ion conductive glass-ceramic material is known in the art for use in lithium electrochemical cells (abstract as applied to claims 20 and 28). These materials include ionic conductivities of 10^{-4} S/cm (Table 2), 10^{-4} S/cm being held to be "about" 10^{-3} S/cm (as applied to claim 7). The composition has an increased ionic conductivity as well as enhanced thermal stability within electrochemical devices.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of JP '471 in view of Bates by selecting the second material to be the lithium ion conductive glass-ceramic material taught by Fu since it would have provided a material which provided both protection to the anode as well as increased the ionic conductivity of the protection composite in the cell. The selection of a known material based on its suitability for its intended use supported a prima facie obviousness determination in *Sindclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945) See also *In re Leshin*, 227 F.2d 197, 125 USPQ 416 (CCPA 1960). MPEP § 2144.07.

11. Claims 24-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP '471 in view of either Chu or JP '247 as applied to claims 1 and 2 above, and further in view of U.S. patent No. 7,282,296 (Visco '296).

JP '471 does not teach of the particular composition of the first layer as specified in claims 24-26.

Visco '296 claims the layer as a reaction product of Li with Cu₃N (claim 1 applied to claim 24). Visco '296 further teaches the layer as a reaction product of Li with Cu₃N with red phosphorous (claim 1 applied to claim 25). Visco '296 further discloses the

layer as a reaction product of Li with PbI₂ (col. 13, ll. 40-50 applied to claim 26). The selection of a known material based on its suitability for its intended use supported a prima facie obviousness determination in *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945) See also *In re Leshin*, 227 F.2d 197, 125 USPQ 416 (CCPA 1960). MPEP § 2144.07. In the case of the instant application, selection of these materials would have been obvious to provide materials having desired levels of ionic conductivity, chemical compatibility with the lithium anode and protection of the reactive lithium active material.

Response to Arguments

12. Applicant's arguments presented in the amendment filed September 5, 2008, with respect to Chu have been reconsidered and are persuasive.

The phrase "configured to" is not necessarily limiting to the extent that Applicant argues. The extent of the configuration is held to be defined to the extent the claims recite limitations pertaining to the anode. The prior art combination teach of the same anode composition and thus the anode is configured for supplementation of active material. While the particular cell housing of JP '471 may not be designed for supplementation of active material in the same manner disclosed in the instant application, the cell, in combination with the teachings of the secondary reference, does obviate the claimed anode structure and supplementation could be possible to the claimed anode structure.

In addition, the instant application itself teaches of an embodiment wherein the supplemental active material is supplied from the second lithium layer (see first

paragraph on page 7). Thus the cell can be a closed cell structure having two lithium layers disposed between a layer of aluminum or silver (such as those configurations shown by Chu or JP '247) and still be configured for supplementation of active material.

Thus the fact that the primary reference teaches of a closed cell structure is persuasive in overcoming the prior art teaching since the instant application does not preclude that the cell can be a closed cell structure (see first paragraph of page 7 of the specification) and the argument is not persuasive.

Chu teaches of lithium anode configuration wherein the anode includes two lithium active layers disposed about a metal bonding layer such as aluminum or silver (col. 3, ll. 30-36). (see Figs. 2C-2F and col. 11, line 58 through col. 12, line 54). JP '247 discloses of a lithium battery wherein the anode is configured as a 3 layer structure with two outer lithium layers 2 disposed about an aluminum inner layer 1 (abstract and Fig. 1).

These configurations are identical to the claimed anode structure and thus are held to be renewable active metal anodes, configured for supplementation of the active metal.

Thus the prior art rejections are still held to reasonably obviate the claimed invention and the prior art rejections stand.

Conclusion

13. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gregg Cantelmo whose telephone number is 571-272-1283. The examiner can normally be reached on Monday to Thursday, 8:30-6:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pat Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Gregg Cantelmo/
Primary Examiner, Art Unit 1795